Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A method of directly operating a solid oxide fuel cell having an anode and a cathode, the method comprising:

reacting molecular oxygen and a compound having formula 1 via a thermal composition reaction:

CH_3-O-R 1

wherein R is alkyl, aryl, alkaryl, or aralkyl at a sufficient temperature of less than about 650°C to form a thermal composition reaction product mixture comprising carbon monoxide, molecular hydrogen, and a reaction product including R; and

contacting the anode of a solid oxide fuel cell with the thermal composition reaction product mixture to directly oxidize the reaction product including R.

2. (Original) The method of claim 1 wherein the compound having formula 1 is dimethyl ether.

3. (Previously Presented) The method of claim 2 wherein the reaction product including an R group is methane.

4. (Previously Presented) The method of claim 1 wherein the molar ratio of molecular oxygen to a compound having formula 1 in the reacting step is from about 0.1 to about 3.0.

5. (Previously Presented) The method of claim 1 wherein the molar ratio of molecular oxygen to a compound having formula 1 in the reacting step is from about 0.1 to about 1.0.

6. (Cancelled)

7. (Previously Presented) The method of claim 1 wherein the sufficient temperature is in the range of about 450°C to about 650°C.

8. (Cancelled)

9. (Previously Presented) The method of claim 1 wherein the sufficient temperature is in the range of about 550°C to about 600°C.

10. (Original) The method of claim 1 wherein the anode comprises a nickel-containing cermet.

11. (Original) The method of claim 1 wherein the anode comprises a component selected from the group consisting of nickel mixed with gadolina doped ceria, nickel mixed with yttria doped ceria zirconia, or nickel mixed with yttria doped zirconia.

12. (Previously Presented) The method of claim 9 further comprising:

combining air and the compound having formula 1 for the reaction of molecular oxygen and the compound having formula 1, wherein the compound having formula 1 is dimethyl ether, the first mixture includes 33% by volume of dimethyl ether, and the sufficient temperature is a temperature of about 550°C.

13. (Original) The method of claim 1 wherein R is a C_{1-6} alkyl.

14. (Currently Amended) A method of directly operating a solid oxide fuel cell having an anode and a cathode, the method comprising:

reacting air and dimethyl ether via a thermal composition reaction at a sufficient temperature of less than about 650°C to form a thermal composition reaction product mixture comprising carbon monoxide, methane, and molecular hydrogen; and

contacting the anode of a solid oxide fuel cell with the thermal composition reaction product mixture to directly oxidize the methane.

15. (Previously Presented) The method of claim 14 wherein the air is comprised of molecular oxygen and the molar ratio of molecular oxygen to a compound having formula 1 in the reacting step is from about 0.1 to about 3.0.

16. (Previously Presented) The method of claim 14 wherein the air is comprised of molecular oxygen and the molar ratio of molecular oxygen to a compound having formula 1 in the reacting step is from about 0.1 to about 1.0.

17. (Cancelled)

18. (Previously Presented) The method of claim 14 wherein the sufficient temperature is in the range of about 450°C to about 650°C.

19. (Previously Presented) The method of claim 14 wherein the sufficient temperature is about 550°C.

20. (Previously Presented) The method of claim 14 wherein the sufficient temperature is in the range of about 550°C to about 600°C.

21. (Previously Presented) The method of claim 20 wherein the anode comprises Ni-Y_20_3 stabilized ZrO_2 and $(Ce,Y)O_2$.

22. (Currently Amended) A fuel cell system comprising:

a source of a first mixture comprising molecular oxygen and a compound having formula 1:

$$CH_3\text{-}O\text{-}R \qquad 1$$

wherein R is alkyl, aryl, alkaryl, or aralkyl;

a solid oxide fuel cell having an inlet, a conduit and an outlet and an anode and a cathode; and

a heat source surrounding the anode and the cathode of the solid oxide fuel cell, the conduit and a portion of the inlet, the heat source heating the first mixture that is situated within the surrounded portion of the inlet to a sufficient temperature of less than about 650°C to form a thermal composition reaction product mixture via a thermal composition reaction comprising carbon monoxide, molecular hydrogen, and a reaction product including R,

wherein the conduit contacts the anode of the solid oxide fuel cell with the thermal composition reaction product mixture to directly oxidize the reaction product including R.

23. (Original) The system of claim 22 wherein the compound having formula 1 is dimethyl ether.

24. (Original) The system of claim 22 wherein the molar ratio in the first mixture of molecular oxygen to a compound having formula 1 is from about 0.1 to about 3.0.

25. (Original) The system of claim 22 wherein the molar ratio in the first mixture of molecular oxygen to a compound having formula 1 is from about 0.1 to about 1.0.

26. (Original) The system of claim 22 wherein the second mixture further comprises methane.

27. (Cancelled)

28. (Previously Presented) The system of claim 22 wherein the heat source heats the first mixture to a temperature of from about 450°C to about 650°C.

29. (Cancelled)

30. (Previously Presented) The system of claim 22 wherein the heat source heats the first mixture to a temperature of from about 550°C to about 600°C.

31. (Original) The system of claim 22 wherein the anode comprises a nickel-containing cermet.

32. (Previously Presented) The system of claim 22 wherein the anode comprises a component selected from the group consisting of nickel mixed with gadolina doped ceria, nickel mixed with yttria doped ceria zirconia, or nickel mixed with yttria doped zirconia.

33. (Cancelled)

34. (Previously Presented) The method of claim 1 wherein the step of reacting molecular oxygen and the compound having formula 1 produces less than about 10 weight % water and less than about 10 weight % carbon dioxide of the total weight of the reaction product mixture.

35.-43. (Cancelled)

44. (New) The method of claim 1 wherein the thermal composition reaction product mixture consists essentially of carbon monoxide, molecular hydrogen, and the reaction product including R.

45. (New) The method of claim 14 wherein the thermal composition reaction product mixture consists essentially of carbon monoxide, methane and molecular hydrogen.